

CLAIM STATUS

1. (Currently Amended) A method of producing surgical grade calcium sulphate characterised in that the method comprises forming an initial calcium sulphate di-hydrate from synthetic constituents; dehydrating the initial calcium sulphate di-hydrate to form calcium sulphate anhydrite; and subsequently rehydrating the calcium sulphate anhydrite ^{potentially in aqueous solution} by immersing in an aqueous environment and allowing subsequent calcium sulphate di-hydrate to crystallise out.

2. (Original) A method according to claim 1, characterised in that the subsequent di-hydrate is used as a solid material bone filler.

3. (Previously Amended) A method according to claim 1, characterised in that the subsequent di-hydrate is formed into pellets.

4. (Original) A method according to claim 3, characterised in that the crystallized subsequent calcium sulphate di-hydrate is ground prior to forming into pellets.

5. (Original) A method according to claim 1, characterised in that the subsequent calcium sulphate di-hydrate is calcined to form calcium sulphate hemi-hydrate.

6. (Original) A method according to claim 5, characterised in that the calcium sulphate hemi-hydrate is mixed with water to form a settable paste.

7. (Original) A method according to claim 5, characterised in that the calcium sulphate hemi-hydrate is mixed with a salt solution to form a settable paste.

8. (Previously Amended) A method according to claim 5, characterised in that the calcining is hydrothermal to form α calcium sulphate hemi-hydrate.

9. (Original) A method according to claim 8, characterised in that the calcining is carried out in an autoclave.

10. (Original) A method according to claim 9, characterised in that the calcining is carried out at a pressure of 1-6 bar.

11. (Original) A method according to claim 10, characterised in that the calcining is carried out at 2-3 bar.

12. (Previously Amended) A method according to claim 5, characterised in that the calcining is carried out in dry heat conditions.

13. (Original) A method according to claim 12, characterised in that the calcining is carried out at a temperature of 70-200° C.

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14. (Original) A method according to claim 13, characterised in that the calcining is carried out at 150-175° C.

15. (Previously Amended) A method according to claim 8, characterised in that the calcining is carried out for a period of a half to six hours.

16. (Original) A method according to claim 15, characterised in that the calcining is carried out for one to two hours.

17. (Previously Amended) A method according to claim 5, characterised in that following calcining, the calcium sulphate hemi-hydrate is ground to a powder.

18. (Original) A method according to claim 17, characterised in that the powder has particle size of less than 150 microns.

19. (Previously Amended) A method according to claim 1, characterised in that the initial calcium sulphate di-hydrate is formed by mixing soluble calcium and sulphate salts such that calcium sulphate precipitates out.

20. (Original) A method according to claim 19, characterised in that the initial di-hydrate thus formed is washed, and subsequently filtered, crushed and/or dried.
21. (Previously Amended) A method according to claim 19, characterised in that the calcium salt is a chloride.
22. (Previously Amended) A method according to claim 19, characterised in that the calcium salt is a nitrate.
23. (Previously Amended) A method according to claim 19, characterised in that the sulphate is a sodium salt.
24. (Previously Amended) A method according to claim 19, characterised in that the sulphate is a potassium salt.
25. (Previously Amended) A method according to claim 19, characterised in that the sulphate is an ammonium salt.
26. (Previously Amended) A method according to claim 19, characterised in that the calcium and sulphate salts are provided in a substantially equal molecular ratio.
27. (Previously Amended) A method according to claim 1, characterised in that the initial calcium sulphate di-hydrate is formed from neutralising lime with sulphuric acid.
28. (Previously Amended) A method according to claim 1, characterised in that the dehydration of the initial calcium sulphate di-hydrate takes place within a temperature range 110-350°C.
29. (Original) A method according to claim 28, characterised in that the dehydration of the initial calcium sulphate di-hydrate takes place at less than 300°C.

30. (Previously Amended) A method according to claim 1, characterised in that the dehydration of the initial calcium sulphate di-hydrate takes place at a temperature above 350°C to form insoluble anhydrite.

31. (Original) A method according to claim 30, characterised in that the rehydration takes more than five days.

32. (Previously Amended) A method according to claim 1, characterised in that the dehydration of the initial calcium sulphate di-hydrate by the application of heat takes place in an open container.

33. (Previously Amended) A method according to claim 1, characterised in that the dehydration of the initial calcium sulphate di-hydrate by the application of heat takes place in a closed container.

34. (Previously Amended) A method according to claim 1, characterised in that the dehydration of the initial calcium sulphate di-hydrate by the application of heat takes place hydrothermally in the presence of steam.

35. (Previously Amended) A method according to claim 1, characterised in that the rehydration of the calcium sulphate anhydrite takes place immediately following dehydration.

36. (Previously Amended) A method according to claim 1, characterised in that the calcium sulphate anhydrite is fully immersed in water for rehydration.

37. (Previously Amended) A method according to claim 1, characterised in that the calcium sulphate anhydrite is fully immersed in a dilute salt solution for rehydration.

38. (Original) A method according to claim 37, characterised in that the salt solution comprises succinic acid.

39. (Original) A method according to claim 37, characterised in that the salt solution comprises potassium sulphate solution.

40. (Previously Amended) A method according to claim 37, characterised in that the concentration of the salt solution is less than 1%.

41. (Original) A method according to claim 40, characterised in that the concentration of the salt solution is substantially 0.1%.

42. (Previously Amended) A method according to claim 1, characterised in that finely powdered calcium sulphate di-hydrate is added to be present during rehydration such that the powdered calcium sulphate acts as crystal seeds.

43. (Original) A method according to claim 42, characterised in that addition is in the order of 5g per litre of water.

44. (Previously Amended) A method according to claim 28, characterised in that the rehydration takes less than five days.

45. (Previously Amended) A method according to claim 1, characterised in that the subsequent calcium sulphate di-hydrate is dried following crystallisation.

46. (Previously Amended) A method according to claim 8, characterised in that the subsequent calcium sulphate di-hydrate is held in a damp condition prior to calcining.

47. (Cancelled)

48. (New) A method according to claim 1 wherein the aqueous environment comprises a salt.